

Pennsylvania Coastal Zone Management Program
HD1390.3.T56S83 1987 c:1

SUBDIVISION
AND
LAND DEVELOPMENT

CHAPTER 48A

COASTAL ZONE
INFORMATION CENTER

FROM THE
CODE
OF THE
TOWNSHIP OF
TINICUM

COUNTY OF DELAWARE
COMMONWEALTH OF PENNSYLVANIA

1987

HD
1390.3
.T56
S83
1987

TABLE OF CONTENTS

SECTION		PAGE
I	<u>GENERAL PROVISIONS</u>	
	48A- 1 TITLE.....	1
	48A- 2 AUTHORITY.....	1
	48A- 3 EFFECTIVE DATE.....	1
	48A- 4 LEGISLATIVE INTENT.....	1
	48A- 5 INTERPRETATION.....	2
	48A- 6 JURISDICTION.....	2
	48A- 7 EXCEPTIONS.....	3
	48A- 8 SEVERABILITY.....	3
	48A- 9 REPEALER.....	4
	48A-10 PENALTIES.....	4
II	<u>ADMINISTRATION</u>	
	48A-11 REQUIREMENT OF REVIEW.....	5
	48A-12 REVIEW OBJECTIVES.....	5
	48A-13 APPLICATION AND SUBMISSION PROCESS.	5
	48A-14 SKETCH PLAN SUBMISSION AND REVIEW..	6
	48A-15 SKETCH PLAN REQUIREMENTS.....	6
	48A-16 PRELIMINARY PLAN SUBMISSION AND RE- VIEW REQUIREMENTS.....	8
	48A-17 FINAL PLAN SUBMISSION AND REVIEW RE- QUIREMENTS.....	9
	48A-18 REVIEW AND APPROVAL OF FINAL PLANS.	11
	48A-19 CONDITIONS OF APPROVAL OF FINAL PLANS.....	11
	48A-20 RECORDING OF PLANS.....	13

TABLE OF CONTENTS
(CONTINUED)

SECTION		PAGE
III	<u>DESIGN STANDARDS FOR ALL SUBDIVISIONS AND LAND DEVELOPMENTS</u>	
	48A-21 APPLICATION.....	14
	48A-22 GENERAL STANDARDS.....	14
	48A-23 SPECIFIC STANDARDS.....	15
IV	<u>DESIGN STANDARDS FOR RESIDENTIAL SUBDIVISION AND LAND DEVELOPMENTS</u>	
	48A-24 BLOCK DESIGN.....	27
	48A-25 LOT DESIGN.....	27
	48A-26 STREET DESIGN.....	28
V	<u>DESIGN STANDARDS FOR NON-RESIDENTIAL SUBDIVISIONS AND LAND DEVELOPMENTS</u>	
	48A-27 APPLICABILITY.....	33
	48A-28 SITE DESIGN.....	33
	48A-29 BLOCK DESIGN.....	34
	48A-30 LOT DESIGN.....	34
	48A-31 BUILDING LOCATIONS.....	34
	48A-32 STREET DESIGN.....	35
	48A-33 STREET INTERSECTIONS.....	36
	48A-34 CUL-DE-SACS.....	37
	48A-35 PARKING.....	37
	48A-36 SCREENING AND BUFFERING.....	38
VI	<u>IMPROVEMENT SPECIFICATIONS</u>	
	48A-37 GENERAL REQUIREMENTS.....	39
	48A-38 PERFORMANCE GUARANTEE.....	39
	48A-39 MAINTENANCE GUARANTEE.....	39

TABLE OF CONTENTS

SECTION		PAGE
	48A-40 REQUIRED IMPROVEMENTS.....	41
	48A-41 RELEASE FROM IMPROVEMENT BOND.....	42
VII	<u>DEFINITIONS</u>	
	48A-42 WORD USAGE.....	43
	48A-43 DEFINITIONS.....	43

LIST OF APPENDICES

APPENDIX A	RATIONAL FORMULA.....	A-1
APPENDIX B	MANNING'S EQUATION.....	B-1

CHAPTER 48A

TINICUM TOWNSHIP SUBDIVISION AND LAND DEVELOPMENT ORDINANCE

SECTION I GENERAL PROVISIONS

48A-1. TITLE.

This Ordinance shall be known and may be cited as the "Township of Tinicum Subdivision and Land Development Ordinance".

48A-2. AUTHORITY.

The Board of Commissioners of the Township of Tinicum, by authority of Section 501 of the Pennsylvania Municipalities Planning Code Act 247 as amended, hereby adopts ordinance #48A of 1987 known as "The Township of Tinicum Subdivision and Land Development Ordinance".

48A-3. EFFECTIVE DATE.

This Ordinance shall become effective thirty (30) days after adoption by the Township Commissioners, and shall remain in effect until modified, amended, or rescinded by the Board of Commissioners of Tinicum Township.

48A-4. LEGISLATIVE INTENT.

The regulations set forth herein have been established for the following purposes:

48A-4.1. To protect and provide for the public health, safety, and general welfare of the citizens of Tinicum Township.

48A-4.2. To provide for adequate and efficient transportation, water, sewerage, parks, recreation, and other public requirements and facilities.

48A-4.3. To establish reasonable standards of design and procedures for subdivisions and resubdivisions in order to further the orderly layout and use of the land.

48A-4.4. To protect the social and economic stability of the Township and conserve the value of land and buildings in the Township.

48A-4.5. To assure sites suitable for building purposes and human habitation.

48A-4.6. To assist the orderly, efficient, integrated, and harmonious development of the Township.

48A-4.7. To ensure coordination of subdivision and land development plans with Township, County, and Commonwealth improvements plans.

48A-5. INTERPRETATION.

The regulations set forth in this Subdivision and Land Development Ordinance shall be interpreted as the minimum requirements to meet the above stated purposes. Where the provisions of this Ordinance impose greater restrictions than those of any other applicable ordinance, statute, or regulation, the provisions of this Ordinance shall prevail. Where the provisions of any other ordinance, statute, or regulation impose greater restrictions than those of this Ordinance, the provisions of such statute, ordinance, or regulation shall prevail.

48A-6. JURISDICTION.

This Subdivision and Land Development Ordinance shall apply to all subdivisions and land developments undertaken wholly or partly in Tinicum Township.

48A-6.1. Compliance Required.

48A-6.1.a. No subdivision or land development of any lot, tract, or parcel of land shall be made, and no street, sanitary sewer, water main, gas, oil, or electric transmission line, or other facilities in connection therewith shall be laid out, constructed, opened, or dedicated for public use of travel or for the common use of occupants of buildings abutting thereon, except in accordance with the Subdivision and Land Development Ordinance regulations adopted herein. Conveyances, resubdivisions, and reverse subdivisions shall be considered new subdivisions.

48A-6.1.b. No lot in a proposed subdivision or land development may be sold, and no final permit to erect any building in a subdivision or land development may be issued unless and until a final plan has been approved and recorded and either the required improvements in connection

therewith have been constructed or the Township has been assured by means of a letter of credit, corporate bond, or other security acceptable to the Township that the improvement will subsequently be installed.

48A-6.2. Compliance with Township Ordinances.

In addition to the provisions of this Ordinance, every subdivision or land development must be in compliance with all Tinicum Township ordinances applicable to the particular site.

48A-6.3. Approval Required.

No building permit or certificate of occupancy shall be issued for any lot which was created by subdivision after the effective date of, and not in conformity with, the provisions of these subdivision regulations, and no construction of any public or private improvements shall take place or be commenced except in conformity with these regulations.

48A-7. EXCEPTIONS.

48A-7.1. Hardships.

For subdivisions or land developments where the Board of Commissioners determines that extraordinary hardships or difficulties may result from strict compliance with these regulations, and the purposes of these regulations may be served to a greater extent by an alternative proposal, the Board of Commissioners may authorize a waiver of the requirements of this Ordinance so that substantial justice may be done. Such action shall be consistent with the public interest and with the character of the community.

48A-7.2. Excellence of Design.

Exceptions to the provisions of this Ordinance may be authorized by the Board of Commissioners in cases where a literal enforcement of this Ordinance would impede or thwart site plans manifesting special economy, imaginative design, or creative use of resources.

48A-8. SEVERABILITY.

Should any section, subsection, paragraph, clause, or provision of this Ordinance be

declared unconstitutional, invalid, or illegal, such decision shall not affect the validity of this Ordinance as a whole or any part thereof other than the part so decided to be unconstitutional, invalid, or illegal.

48A-9.

REPEALER.

The existing Subdivision and Land Development regulations, Ordinance #529, adopted by the Board of Commissioners of the Township of Tinicum on 12-18-78 as last amended by Ordinance #574, being Chapter 48A of the Code of Tinicum Township, is hereby repealed.

48A-10.

PENALTIES.

Any person, being the owner or a representative of the owner of any lot, tract, or parcel of land who lays out, constructs, opens, or dedicates any street, sanitary sewer, storm sewer, water main, or other improvement intended for public or common use, or who sells or transfers any land, or erects any building or structure on the land within a subdivision or land development prior to or without submitting a final plan prepared in full compliance with the provisions and requirements of this and all applicable Township ordinances, or who records such a plan without the Final approval of the Board of Commissioners of Tinicum Township shall be in violation of this Section and of the Planning Code, Act 247 as amended, and shall be guilty of a misdemeanor and upon conviction thereof shall pay a fine to Tinicum Township of an amount not exceeding one thousand dollars (\$1,000.00).

SECTION II

ADMINISTRATION

48A-11. REQUIREMENT OF REVIEW

48A-11.1. Prior to the approval and recording of any subdivision or land development within Tinicum Township, the owner or representative of the owner shall submit plans to the Township for review and report in accordance with the following table of stages for submittal and review:

TABLE 1

REVIEW STAGES

Review Stage	Minor Subdivision	Major Subdivision	Land Development
Sketch	Optional	Recommended	Recommended
Preliminary	Recommended	Mandatory	Mandatory
Final	Mandatory	Mandatory	Mandatory

48A-12. REVIEW OBJECTIVES

48A-12.1. The review procedures of the Township and County Planning Commissions are intended to ensure that each subdivision and land development takes into consideration the public health, safety, and welfare of the citizens of Tinicum as well as maintaining and furthering the purposes and objectives of the regulations and standards set forth in this ordinance.

48A-13. APPLICATION AND SUBMISSION PROCESS

48A-13.1. Each presentation of a sketch, preliminary, or final plan shall be considered a separate submission and the application and review process will be the same for each submission, although the review fees shall be waived for subsequent submissions within one hundred and twenty (120) days of the preceding submission.

48A-13.2. For all review stages where review and report are required and requested, ten (10) copies of every subdivision and/or land development site plan shall be submitted to the Township Secretary along with a fee which is to be determined by a fee schedule approved by the Township Board of Commissioners.

48A-13.3. In addition, the applicant shall submit to the Township Secretary four (4) copies of the subdivision or land development plans, the Delaware County Planning Commission's Application for Review form, and the applicable review fee as established by Resolution #7601 of Delaware County to the Township. The Township will then forward the plans, application, and fee to the Delaware County Planning Departments for review and report within forty-five (45) days from the date of receipt.

48A-14. SKETCH PLAN SUBMISSION AND REVIEW

48A-14.1. A sketch plan of any proposed subdivision or land development may be submitted for review and report to the Township Board of Commissioners and the Delaware County Planning Department for purposes of informal discussion between the Township, County Planning staff, and the applicant in order to provide a basis for review of the concept and general design of the proposal prior to the preparation of detailed design plans.

48A-14.2. While the submission of sketch plans is not a required review stage, it is strongly encouraged for the benefit of the developer and the Township. The review of sketch plans can prove to be instrumental in resolving many issues at an early stage in order to conserve time, effort, and expense.

48A-14.3. If members of the Township Planning Commission or County Planning staff are consulted in person and no written report is sought, the sketch plan may contain any data that are deemed sufficient to advise the subdivider of the merits, deficiencies or shortcomings of the plan. Sketch plans involving no written report are exempt from fee requirements.

48A-14.4. A review of a sketch plan, whether resulting in verbal comments or in a written report, shall not be regarded as a formal site plan review and shall not constitute part of the official record of the development.

48A-15. SKETCH PLAN REQUIREMENTS

If a written report of the sketch plan review is requested by the applicant, the following requirements shall be met:

- 48A-15.1. Sketch plans shall be legibly drawn to a scale of not less than one (1) inch equals two hundred (200) feet.
- 48A-15.2. Sketch plans shall be accompanied by a brief narrative describing the intent of the proposal, major planning assumptions, issues, and objectives of the proposed subdivision or land development.
- 48A-15.3. Sketch plans and all future subdivision or land development plans must be in compliance with the provisions of this Ordinance and the provisions of the Tinicum Township Zoning Ordinance, Chapter 61, of the Code of Tinicum Township.
- 48A-15.4. The following information is required to be included on the sketch plan:
- a. A location map at a scale of one (1) inch equals one thousand (1,000) feet showing the entire parcel and its relation to the surrounding area.
 - b. Name and address of the record owner.
 - c. Name and seal of the engineer, surveyor, planner, architect, or landscape architect responsible for the sketch plan.
 - d. Title of the plan, north arrow, scale, and date of the drawing, and any revisions.
 - e. Approximate tract boundaries and a statement of the total acreage of the tract and each proposed lot.
 - f. Zoning districts and district boundary lines.
 - g. The nature of all contemplated uses.
 - h. Significant natural physical features within the tract and adjacent peripheral strip, watercourses, ponds, lakes, wetlands, and proposed major changes to these features.
 - i. The proposed general layout of lots and approximate locations of existing buildings.

- j. Proposed streets and their relationships to the existing network outside the site.
 - k. Locations, widths and purposes of all existing rights-of-way and easements and the substance of similar proposed restrictions.
 - l. The 100 year floodplain boundary line.
- 48A-16. PRELIMINARY PLAN SUBMISSION AND REVIEW REQUIREMENTS
- 48A-16.1. Preliminary plans shall be legibly drawn at a scale of no less than one (1) inch equals one hundred (100) feet.
- 48A-16.2. The preliminary plan shall include all of the information required on the sketch plan as well as the following additional information:
- a. The name and seal of the professional land surveyors, engineer, architect, or landscape architect responsible for the preliminary plan.
 - b. Tract boundaries with bearings and distances and a statement of the total acreage of the tract to the nearest tenth of an acre.
 - c. Bearings and distances of each proposed lot line within the tract.
 - d. Zoning districts and the applicable area and bulk requirements.
 - e. The 100 year floodplain boundary line.
 - f. All existing and proposed streets within and adjacent to the tract along with right-of-way widths and cartway widths together with preliminary profiles.
 - g. The method for controlling surface water runoff.
 - h. All existing sanitary and storm sewers, water lines, fire hydrants, utility transmission lines, culverts, bridges, and railroads within the tract and within two hundred (200) feet of its boundaries.
 - i. Contours at two (2) foot intervals except where ground is at a grade of two (2) percent or less, in which case such

contours shall be shown at one (1) foot intervals, National Geodetic Vertical Datum.

- j. Preliminary profiles and other explanatory data concerning the installation of sanitary and storm sewage systems and water distribution systems.

48A-16.3. Additionally, Erosion and Sedimentation Control Plans shall be submitted to the Township, the County Planning Commission, and the Delaware County Conservation District.

48A-17. FINAL PLAN SUBMISSION AND REVIEW REQUIREMENTS

48A-17.1. The requirements for submission procedure of all final subdivision and land development plans are the same as those for preliminary plans.

48A-17.2. The contents of final plans shall include all of the information required on the preliminary plans as well as the following more detailed and complete information:

- a. Name and seal of the professional land surveyor, architect, or engineer responsible for the plan and a certification by him that the plat represents a survey made by him or by his authorized licensed representative and that all of the information illustrated on the plan is accurate and correct and that all the requirements of this Ordinance have been met.
- b. Lot numbers together with accurate dimensions and areas.
- c. Accurate distances and directions to the nearest established street corners or official monuments. Reference corners shall be accurately described on the final plan.
- d. Final cross-sections of all proposed streets showing right-of-way, paved width, location of curbs and sidewalks; and profiles of streets showing grades approved by the Tinicum Township Engineer.

- e. Final profiles and other explanatory data concerning the installation of sanitary and storm sewerage systems and water distribution systems.
- f. Names of the owners of all adjacent property owners shall be shown on the final plan.
- g. A copy of any existing or proposed deed restrictions or protective covenants applying to the proposed developments shall be submitted with the final plans.
- h. A final Erosion and Sedimentation Control Plan including certification that any related permit required by the Pennsylvania Department of Environmental Resources has been issued.
- i. A plan illustrating the proposed grading and drainage of the site.
- j. Certificate of proposed dedication of streets and other areas to be devoted to public uses.
- k. The exact locations, widths, and purposes of existing and proposed easements and utility rights-of-way.
- l. The location of all monuments at the permanent outbounds of the site.

The following additional information requirements shall apply to all land development plans and to subdivision plans where applicable:

- m. The locations and heights of all structures, including freestanding signs, and distances between buildings and between buildings and streets or property line.
- n. Number of dwelling units, by type, by number of bedrooms, and the location of square footage of floor space to be devoted to non-residential use, together with use specifications.
- o. The location, square footage, and number of vehicular parking spaces in all parking areas, and specifications of type and size of other parking facilities.

- p. Locations and widths of all private driveways and pedestrian walkways, if any, and any controls proposed at their intersections with streets carrying vehicular traffic.
- q. The exact locations and sizes of all public or common open space areas, recreational areas and facilities and the ownership and proposed maintenance, offers of dedication, or covenants governing their use.

48A-18. REVIEW AND APPROVAL OF FINAL PLANS

48A-18.1. The Board of Commissioners, after considering the recommendations of the Township Planning Commission, the Township Engineer, and the Delaware County Planning Commission, shall determine whether or not the subdivision or land development plan and supporting certifications are satisfactory. Based on such recommendations, the Board of Commissioners shall take action and notify the applicant, in writing, of such action within ninety (90) days of the submittal of the plan.

48A-18.2. Such approval by the Board of Commissioners shall not be deemed to constitute or effect an acceptance by the Township of the dedication of any street or other proposed public way, space, or area shown on the final plan.

48A-19. CONDITIONS OF APPROVAL OF FINAL PLANS

48A-19.1. The owner shall and will agree in writing, in a form to be approved or prepared by the Solicitor for the Township, that the owner will lay out and improve the roads, streets, lanes and alleys and construct all of the improvements, including necessary grading, paving, curbs, gutters and other street improvements, including sidewalks if required by the plan, streetlights as required, fire hydrants, water mains, street signs, storm sewers and sanitary sewers where connection with any proposed township sewer system is practicable, as shown on the plan or any section or stage of development plan or the application submitted to the Township, or where these improvements are required as a condition of the approval of the plan by the Board of Commissioners within the time or times therein specified. The owner shall agree to install all electrical and telephone

utilities and to provide sufficient right-of-way for such installation and maintenance by the respective utility companies. The owner shall also erect boundary markers or monuments within each development as the Township Engineer shall direct. In all cases, the owner shall be required to install sanitary sewers and connect the same with the existing truckline sewer. The connection of any sewer extension or sewer facilities to the existing township sewer system will not be permitted unless the existing township system is adequate to receive the additional anticipated flow as determined by the Township Engineer. In the event it is determined that it will be necessary to modify, replace or expand portions of the existing sewer system, including pumping stations, lift stations and force mains, as a result of the proposed land development, the owner will be required to pay for all costs incurred by the township for said modifications to the system, including legal and engineering fees.

48A-19.2.

To the extent that streets and/or other improvements are to be dedicated by the terms of the agreement to the Township of Tinicum, the owner shall furnish a certificate of a reputable title insurance company satisfactory to the Board of the Township Commissioners, which, as of the date of approval, shall set forth the name or names of the owner or owners of all property covered by such plans, which shall show and shall contain a list of all mortgages, judgments, liens, easements, contracts and agreements of record in Delaware County, Pennsylvania, which shall affect the property covered by such plan. To the extent that the certificate discloses that any such property shall be subject to any mortgage, judgment, easement, lien, contract or agreement or other matter of record, then, at the option of the Board of the Township Commissioners, the holder or owners of such mortgage, judgments, liens, easements, contracts or agreements shall be required to join in and approve said application before the same shall be acted upon by the Board of the Township Commissioners or agree to release the area to be dedicated to the township from the line of said mortgage, judgment or other similar encumbrance.

48A-20. RECORDING OF PLANS

48A-20.1. The developer shall, within ninety (90) days of the final approval of subdivision and/or land development plans, record such plat in the Office of the Recorder of Deeds in the Delaware County Court House.

The plan of record must include all of the information specified in this Ordinance for final subdivisions, the signatures of the members of the Board of Commissioners of Tinicum Township, and the stamp of the Delaware County Planning Commission.

48A-20.2. The recording of the plan shall not constitute grounds for assessment increases until such time as lots are sold or improvements are installed on the land included on the plan.

SECTION III

DESIGN STANDARDS FOR ALL SUBDIVISIONS AND LAND DEVELOPMENTS

48A-21. APPLICATION

- 48A-21.1 The design standards and requirements outlined in this section will be utilized by the Township Planning Commission, Board of Commissioners and other appropriate local officials in determining the adequacy of all plans for proposed subdivisions and land developments.
- 48A-21.2. These design standards may be altered by the Board of Commissioners for the purpose of achieving economy and ingenuity in design in accordance with modern and evolving principles of site planning and development upon presentation of evidence that the intent of such standards and requirements shall be substantially achieved.
- 48A-21.3. Development shall be planned, reviewed and carried out in conformance with all State, County and Township laws and regulations.

48A-22. GENERAL STANDARDS

- 48A-22.1. Land shall be suited for the purpose for which it is to be used. Unsafe or hazardous conditions such as open quarries, unconsolidated fill, or flood prone areas shall not be subdivided or developed unless the subdivision or land development plan provides for adequate safeguards which are approved by the Planning Commission and the Board of Commissioners.
- 48A-22.2. Consideration shall be given to applicable provisions of the Township Comprehensive Plan and the Delaware County Land Use Plan emphasizing future school sites, recreation sites, water supply and sewage treatment systems, highway alignment and other public facilities. However, consideration must be given to the need for the facilities and utilities mentioned above whether or not they are proposed as part of a comprehensive plan.
- 48A-22.3. The development of a proposed subdivision or land development shall be coordinated with adjacent existing development so that the area, as a whole, may develop harmoniously.

48A-23. SPECIFIC STANDARDS

48A-23.1. Sewage Disposal

48A-23.1.a. All properties in proposed subdivisions and land developments shall be connected to a public sanitary sewer system.

48A-23.1.b. Installation of all sewer lines shall be in strict accordance with the engineering standards and specifications of the Township Engineer.

48A-23.1.c. Manholes for sanitary sewers shall be not more than three hundred fifty (350) feet apart on straight runs, and there shall be a manhole at every point of change in course or grade and at intersections of all sewer lines.

48A-23.1.d. Sanitary sewerage systems shall be located and/or designed to minimize or eliminate infiltration of flood waters into the system or discharges from the system into flood waters. All sanitary sewer systems located in floodplains shall be flood-proofed up to a point one and one-half (1½) feet above the regulatory flood elevation.

48A-23.2. Water Supply

48A-23.2.a. Water lines shall be installed to serve all land developments and each lot in all subdivisions where such service does not presently exist. The installation, location and specifications for the construction of water lines shall comply with all applicable regulations of the water supplier and the Township. Easements shall be provided for the water lines as needed.

48A-23.2.b. Prior to approval by the Planning Commission, it shall be determined by the Township Engineer that the supply of water shall be sufficient in amount and pressure for domestic, business or industrial use as well as for emergency purposes.

48A-23.2.c. The proposed water system must be reviewed by the responsible local water authority, and found to be acceptable.

48A-23.2.d. Fire hydrants must be installed as an integral part of any water supply system and placed no more than one thousand two hundred (1,200) feet apart.

48A-23.2.e. The location, need, design and related features of fire hydrants shall be reviewed by the Township Fire Marshall for conformance with applicable existing laws and regulations.

48A-23.3. Storm Drainage

48A-23.3.a. Overall Considerations

In all subdivisions and land developments, storm drainage facilities shall be provided in order to:

- 1) Permit unimpeded flow of natural water-courses;
- 2) Ensure adequate drainage of all low points along the lines of streets;
- 3) Intercept stormwater runoff along streets at intervals related to the extent and grade of the area drained;
- 4) Provide positive drainage away from buildings;
- 5) Remove surface water from the bottom of vertical grades, lead water from springs and avoid excessive use of cross-gutters at street intersections and elsewhere.

48A-23.3.b. Site Drainage Plan

- 1) A site drainage plan for the proposed subdivision or land development tract shall be prepared and shall illustrate the following information:
 - (a) Calculations of runoff for all points of runoff concentration within the site;
 - (b) Complete drainage system for the subdivision or land development. All existing drainage features which are to be incorporated in the design shall be so identified. Such a drainage system shall meet the standards and specifications of the Tinicum Township Drainage, Grading, and Erosion Control Ordinance (Ordinance #528), those of any other applicable Township ordinance, and

those of the County Soil and Water Conservation District.

- (c) Approval by the Pennsylvania Department of Transportation when drainage structures are to be located on or connected to state highway rights-of-way.

48A-23.3.c. General Drainage Requirements

- 1) The existing points of natural drainage discharge onto adjacent property shall not be altered without the written approval of the affected landowners.
- 2) Any landowner or any person engaged in the alteration or development of land which may affect storm water runoff characteristics shall implement such measures consistent with the provisions of the applicable watershed storm water plan as developed and implemented in response to the State Storm Water Management Act (Act 167 of 1978) in order to prevent injury to health, safety or other property.
 - (a) Such measures shall assure that the maximum rate of storm water runoff is no greater after development than prior to development; or shall manage the quantity, velocity and direction of resulting storm water runoff in a manner which otherwise adequately protects health and property from possible injury or damage.
- 3) No stormwater runoff or natural drainage shall be so diverted as to overload existing drainage systems, or create flooding or the need for additional drainage structures on other private properties or public lands, without approved provisions being made by the developer for properly handling such conditions.
- 4) All streets shall be designed so as to provide for the discharge of surface water away from their rights-of-way. The cross slope of the crown on proposed streets shall be not less than one-quarter ($1/4$) of an inch per foot and not more than three-quarters ($3/4$) of an inch per foot.

- 5) Storm drains, when located in undedicated land, shall be placed within a maintenance easement of a width deemed acceptable by the Township Engineer.
- 6) All storm drain pipes shall be protected by cover of at least eighteen (18) inches with the exception of corrugated aluminum pipes on which there shall be a minimum of thirty (30) inches of cover.
- 7) Storm drainage facilities shall be so designed and provided as to minimize erosion in watercourse channels and at all points of discharge.

48A-23.3.d. Calculation of Storm Runoff and Design of Drainage Systems

- 1) Storm runoff may be calculated by the rational method described in manual number 37 of the American Society of Civil Engineers and explained in Appendix A or where applicable, by the modified rational method. Complete detailed calculations shall be submitted to the Township Engineer at the time of final review.
- 2) Storm drainage systems shall be designed to provide protection from a ten (10) to one hundred (100) year storm as determined by the Township Engineer. A ten (10) year storm design would be appropriate where a storm in excess of the design storm would have minor impact such as inconvenience to traffic on local streets. A twenty-five (25) year storm design would be appropriate where a storm in excess of the design storm would cause major inconvenience to people and traffic in high use areas such as business districts and major highways. A one hundred (100) year storm design would be appropriate where a storm in excess of the design storm would cause damage to existing or future structures or their contents.
- 3) The Manning equation explained in Appendix B shall be used in calculating capacities of watercourses and storm sewers, except culverts which shall be designed utilizing either the rational method or soil conservation method.

48A-23.3.e. Improvement Specifications

- 1) Inlets shall be designed and located to prevent hazardous conditions for vehicles, bicycles or pedestrians.
- 2) The Township Engineer may require additional specifications which may be necessary for spacing and type of inlets and manholes, minimum pipe sizes, and materials and construction methods.

48A-23.4 Utility Easements and Lines

48A-23.4.a. General Regulations

- 1) Where practicable, all utilities, with the exception of on-site laterals, shall be located in public rights-of-way. Where this is not possible, utility easements shall be located on or adjacent to rear or side lot lines to the fullest extent possible.
- 2) In general, the required pipe or other improvement shall be located in the center of the easement.
- 3) Prior to determining the location of easements, the Planning Commission shall require the developer or subdivider to coordinate his plans with those of the local public utilities in order to assure proper location of easements for the installation of the required service.
- 4) No permanent structures or trees shall be placed within such easements.
- 5) Where practicable, utility lines shall share a common utility easement.
- 6) All electric, telephone service, and cable television transmission lines in new residential developments with five (5) or more dwellings shall be placed underground and installed in accordance with the prevailing standards of the utility company providing such services.

48A-23.4.b. Width of Sanitary and Storm Sewers

- 1) Sanitary and storm sewer easements shall have a minimum width of twenty-five (25) feet.

48A-23.4.c. Petroleum and Natural Gas Transmission Lines

- 1) No company intending to install any petroleum, petroleum product or natural gas transmission lines shall be allowed to construct the lines on less than a fifty (50) foot right-of-way. Such lines are to be installed in the center of the right-of-way and shall comply with the applicable standards imposed by State and Federal laws and regulations.
- 2) There shall be a minimum distance of thirty-five (35) feet, measured from the right-of-way line between any proposed dwelling unit or other structure and the right-of-way line of any petroleum, petroleum products or natural gas transmission line which traverses the subdivision or land development.
- 3) The developer or subdivider shall obtain the written approval from the various petroleum or natural gas companies when constructing roads or driveways on or within twenty (20) feet of petroleum, petroleum products or natural gas line easements when required by the utility company.

48A-23.5. Erosion and Sedimentation Control

48A-23.5.a. General Requirements

- 1) All earthmoving activities shall be conducted in such a way as to prevent accelerated erosion and the resulting sedimentation.
- 2) No change shall be made in the contour of the land, and no grading, excavating, removal or destruction of the topsoil, trees or other vegetative cover shall be commenced in any proposed subdivision or land development until such time as a Conservation Plan has been prepared and reviewed by the Delaware County Conservation District. However, the Township Planning Commission may determine that such a plan is not necessary in the case of minor subdivisions.
- 3) The Conservation Plan shall be developed in the form outlined in the Soil Erosion and Sedimentation Control Manual, issued

by the Department of Environmental Resources.

- 4) Final approval for a development tract of twenty-five (25) or more acres will be contingent upon the review and approval by the Pennsylvania Department of Environmental Resources reviewing the Conservation Plan and issuing a permit.*
- 5) Measures used to control erosion and reduce sedimentation shall meet the standards and specifications of the Drainage, Grading and Erosion Control Ordinance of Tinicum Township, (Ordinance #528), an applicable Township ordinance and the Delaware County Conservation District.
- 6) The Township Engineer, or other designated local official, shall ensure compliance with the appropriate specifications, copies of which are available from the Delaware County Conservation District.

48A-23.5.b. Grading for Drainage

- 1) Grading for drainage shall be performed whenever necessary in order to provide more suitable sites for building and other uses, improve surface drainage, and control erosion.
- 2) All lots, tracts, or parcels in a proposed subdivision or land development shall provide proper drainage away from buildings and dispose of surface water without ponding except where an alternative drainage system is approved by the Township Commissioners. Natural drainage patterns shall be preserved whenever possible.
- 3) All drainage facilities shall be designed to adequately handle the surface runoff and carry it to the nearest suitable outlet, such as a curbed street, storm drain, or natural watercourse. When drainage swales are used to divert surface waters away from buildings, they

* Required by Pennsylvania Rules and Regulations, Department of Environmental Resources, Chapter 102, as amended, "Erosion Control" under the Authority of the Clean Steams Law.

shall be sodded or planted and shall be of such slope, shape, and size as to conform with the requirements of the Delaware County Conservation District. Concentration of surface water runoff shall be permitted only in swales or watercourses.

- 4) Cut and fill slopes shall be no steeper than two (2) horizontal feet to one (1) vertical foot unless stabilized by a retaining wall or curbing or are approved by the Board of Commissioners subject to special conditions.
- 5) Adequate provisions shall be taken to protect against adverse effects of cut and fill.
- 6) Fills shall not encroach on natural watercourses or constructed channels; when placed adjacent to natural watercourses or constructed channels they shall have suitable protection against erosion during periods of flooding.
- 7) During grading operations, necessary measures for dust control will be exercised.
- 8) Grading equipment will not be allowed to cross live streams. Provisions will be made for the installation of culverts.

48A-23.5.c. Performance Principles

- 1) The following measures are effective in minimizing erosion and sedimentation and shall be included when applicable on the Conservation Plan:
 - (a) Stripping of vegetation shall be done in such a manner as will minimize erosion.
 - (b) Salient natural features should be preserved when possible and cut-fill operations shall be kept to a minimum to create the least erosion potential.
 - (c) The disturbed area and the duration of exposure shall be kept to a practical minimum.

- (d) Temporary vegetation and or mulching shall be used to protect exposed critical areas during development.
- (e) The permanent vegetation and structural erosion and drainage measures shall be installed as soon as practical in the development.
- (f) Provisions shall be made to effectively accommodate the increased runoff caused by changed soil and surface conditions during and after development. Where necessary the rate of surface water runoff will be structurally retarded.
- (g) Sediment in the runoff water shall be trapped until the disturbed area is stabilized by the use of debris basins, sediment basins, silt traps, or similar measures.

48A-23.6. Natural Feature Preservation

48A-23.6.a. General Requirements

The design and development of all subdivision and land developments shall preserve, whenever possible, natural features such as site terrain, woodlands, specimen trees, natural watercourses and bodies of water, wetlands, rock outcroppings and scenic views.

48A-23.6.b. Topography

The natural terrain of the proposed subdivision or land development shall be retained whenever possible. Cut and fill shall be kept to a minimum. Cut and fill operations shall be used either to achieve acceptable minimum standards (for street grades, parking areas, building sites) or to enhance the quality of site design (e.g. berms or swales which add visual interest, and perform functions such as screening or drainage).

48A-23.6.c. Vegetation and Planted Screens

- 1) Significant tree masses and specimen trees shall be preserved wherever possible. The building envelopes should be located within the allowable building area in such a manner as to minimize damage to vegetation. Where possible,

existing open areas should be developed instead of wooded areas. Areas in which trees are retained should remain undisturbed out to the canopy drip line and at the original grade level wherever possible.

- 2) Effective planted visual screens shall be provided along the rear of reverse frontage lots and along side and/or rear property lines of lots traversed by zoning boundary lines which separate a residential district from a non-residential district.
- 3) Screening and buffering shall comply with the requirements of the Township Zoning Ordinance, Chapter 61 of the Code of Tinicum Township.
- 4) Existing wooded areas shall be protected to prevent unnecessary destruction. Trees with a minimum trunk caliper of six (6) inches, measured eighteen (18) inches above ground shall be maintained or replaced immediately following construction. Replacement trees shall be a minimum trunk caliper of two (2) inches at a height of eighteen (18) inches above finished grade.
- 5) Trees shall be required in all new subdivisions and land developments and shall be provided in accordance with the following standards:
 - a) No tree shall be planted within the street right-of-way.
 - b) At least one (1) tree shall be planted for each lot in a subdivision.
 - c) Such tree shall be planted in the front yard.
 - d) All such trees shall be sound, healthy, and vigorous and shall be free of insects, insect eggs, and larvae.
 - e) The trunk caliper, measured at the height of eighteen (18) inches shall be a minimum of two inches.

48A-23.6.d. Aquatic Features

Aquatic features such as natural watercourses, bodies of water and wetlands shall be protected wherever possible where practicable. Stream and river frontage shall contain an access point to the water. Maintenance easement areas shall be provided at intervals of no more than one-half ($\frac{1}{2}$) mile. These access points shall be not less than twenty-five (25) feet in width.

48A-23.6.e. Wetlands

See Section 404 of the Federal Clean Water Act (1977) and Chapter 105 of the Pennsylvania Dam Safety and Encroachment Act (1978) for requirements relating to development of wetland areas.

48A-23.6.f. Floodplain Protection

See Tinicum Township Floodplain Ordinance, Section 527, contained in Chapter 20A of the Code of Tinicum Township.

48A-23.7. Miscellaneous Provisions

48A-23.7.a. Sidewalks

- 1) Sidewalks shall be provided in all residential subdivisions and land developments. In non-residential subdivisions and land developments sidewalks shall be provided as required by the Planning Commission.
- 2) Sidewalks shall have a minimum width of four (4) feet and shall be located whenever possible, within the street right-of-way line. A grass planting strip may be required between the curb and sidewalk.

48A-23.7.b. Fire Fighting Access Easements and Fire Hydrants

- 1) The areas where, in the opinion of the Chief of the Fire Department, there will exist any fire hazards, unobstructed fire protection access easements shall be provided. The size, location, design and

grading of such easements shall be recommended by the Fire Marshall.

- 2) The need, location, design and related features of fire hydrants shall be determined by the Fire Marshall in accordance with applicable laws and regulations.

48A-23.7.c. Street Names and Address Numbering

- 1) Proposed streets which are in alignment with existing, named streets shall bear the name of the existing streets.
- 2) In no case shall the name of a proposed street duplicate or substantially approximate an existing street name in the Township, in order to avoid confusion and delay in the operations of the postal service, police department or emergency vehicles.
- 3) All proposed street names shall be subject to the approval of the Board of Commissioners after consultation with the local Postmaster, Fire Marshall and Police Chief.
- 4) Streets shall be identified by signs approved by the Township Code Enforcement Officer.
- 5) In all subdivisions and land developments commenced after the effective date of this Ordinance, the address numbers shall be assigned by the Code Enforcement Officer and shall be clearly visible from the street.

SECTION IV

DESIGN STANDARDS FOR RESIDENTIAL SUBDIVISIONS AND LAND DEVELOPMENTS

48A-24. BLOCK DESIGN

48A-24.1. Block Length

48A-24.1.a. The length of residential blocks shall be no more than one thousand two hundred (1,200) feet.

48A-24.2. Block Depth

48A-24.2.a. Wherever practicable, residential blocks shall be of sufficient depth to accommodate two (2) tiers of lots, except:

- 1) Where reverse frontage lots are required adjacent to an arterial street; or
- 2) Where prevented by the size, topographical conditions or other inherent conditions of the property, in which case the Township Planning Commission may authorize a single tier of lots.

48A-25. LOT DESIGN

48A-25.1. General Lot Design Standards

48A-25.1.a. Within the provisions of the Township Zoning Ordinance, the size, shape and orientation of lots shall be appropriate for the type of development contemplated.

48A-25.1.b. Side lines of lots shall be, to the extent practicable, at right angles to straight streets and on radial lines to curved streets.

48A-25.1.c. Lot lines shall follow, rather than cross, municipal boundaries in order to avoid jurisdictional problems.

48A-25.1.d. Generally, the depth of residential lots shall be not less than one (1) nor more than four (4) times their width.

48A-25.1.e. If remnants of land remain after subdividing, they shall be either:

- 1) Incorporated into existing or proposed lots.

- 2) Legally dedicated to public use, if acceptable to the Township.

48A-25.2. Lot Frontage

48A-25.2.a. All residential lots shall have direct access to an existing or proposed public street.

48A-25.2.b. Reverse frontage lots may be required to provide separation of residential development from arterial streets or to overcome disadvantages of terrain or other natural features of a proposed development tract.

48A-25.2.c. All reverse frontage lots shall have a rear yard with an effective planted visual screen which shall be placed immediately adjacent to the street right-of-way.

48A-25.2.d. Minimum lot frontages and areas shall be regulated by the Township Zoning Ordinance.

48A-25.3. Lot Access

48A-25.3.a. Residential lots having direct access to an arterial street shall be avoided whenever possible. Where direct access to an arterial street cannot be avoided, adequate turnaround space shall be provided behind the right-of-way line.

48A-26. STREET DESIGN

48A-26.1. General Requirements

48A-26.1.a. Proposed streets shall be properly related to the official map of the Township and should be coordinated with road and highway plans of the State and County. Streets shall be designed to provide adequate access to all lots or parcels with due regard for soil conditions, projected volumes of traffic, and further subdivision or land development possibilities in the area.

48A-26.1.b. The street system of a proposed subdivision or land development shall be designed to create a hierarchy of street functions.

48A-26.1.c. Local streets shall be designed so as to discourage through traffic and excessive speed. Where a subdivision or land development abuts or contains an existing or proposed arterial street, the Planning Commission may require marginal access streets, reverse front-

tage lots, or such other treatment which will provide:

- 1) Protection for abutting properties;
- 2) Reduction in number of intersections and/or curb cuts with the arterial street;
- 3) Separation of local and through traffic; and
- 4) Preservation and enhancement of traffic safety.

48A-26.1.d. If lots resulting from the proposed subdivision are large enough to allow for resubdivision or, if a portion of the tract is not subdivided, adequate street rights-of-way to permit further subdivision shall be provided as necessary, and located so as to allow proper development of surrounding properties.

48A-26.1.e. Where a subdivision or land development abuts or contains an existing street right-of-way of improper width or alignment, the Planning Commission may require the dedication or reservation of additional land (ultimate right-of-way) sufficient to widen the street or correct the alignment. Where an additional dedication or reservation is required, all building setback lines will be measured from such dedicated or reserved right-of-way lines.

48A-26.1.f. Proposed streets which are obviously in alignment with existing streets, shall bear the names of the existing streets.

48A-26.1.g. All streets shall be graded and improved to conform to Township construction standards and specifications.

48A-26.1.h. Road designs and specifications shall be approved by the Township Engineer in accordance with the construction plans required for final plan review.

48A-26.2. Street Right-of-Way and Cartway Widths

48A-26.2.a. Street right-of-way and cartway widths in proposed subdivisions and land developments shall conform to the minimum standards listed in the Table below:

TABLE 2

STREET DESIGN STANDARDS		
	Local (Ft.)	Collector (Ft.)
Right-of-Way Width	50	60
Cartway Width	30-34 ¹	34-38 ²
Traffic Lane Width	12	12
Parking Lane Width	8 where required	

- ¹ In the case of local streets, the minimum cartway width shall be determined, in part, by the number of parking lanes permitted as noted below:

No on-street parking -- 30 ft. cartway
 Parking on one side -- 34 ft. cartway

In no case shall parking be permitted on both sides of a new local street.

- ² In the case of collector streets, cartway widths shall be determined by variables such as number of parking lanes, curvature of the road and projected traffic volumes.

48A-26.2.b. The standards set forth in Table 2 above may be modified by the Township Planning Commission upon the recommendation of the Township Engineer when an analysis of proposed development densities, projected traffic volumes, and provisions for off-street parking indicate the desirability of such modification. The burden of proof shall be on the applicant to justify the adequacy of cartways or rights-of-way which are less than those listed in Table 2.

48A-26.3. Horizontal Curves

48A-26.3.a. Whenever street centerlines are deflected more than five (5) degrees, connection shall be made by horizontal curves.

48A-26.3.b. Horizontal curves shall be designed with the following minimum radii:

- 1) Local streets -- one hundred fifty (150) feet.
- 2) Collector streets -- three hundred (300) feet.

- 3) Arterial streets -- five hundred (500) feet.
- 48A-26.3.c. A minimum tangent of one hundred (100) feet shall be required between reverse curves on a street and between a curve and a street intersection where one of the streets is a collector or arterial street.
- 48A-26.4. Vertical Curves
- 48A-26.4.a. Vertical curves shall be used in changes of grade exceeding one (1) percent.
- 48A-26.5. Street Intersections
- 48A-26.5.a. Streets shall intersect as nearly as possible at right angles.
- 48A-26.5.b. Multiple intersections involving the intersection of more than two (2) streets shall be prohibited.
- 48A-26.5.c. Two streets intersecting a third street from opposite sides shall either intersect with a common centerline or their centerlines shall be offset as noted below:
- 1) The two streets shall be separated by a distance of one hundred fifty (150) feet between centerlines measured along the centerline of the street being intersected when all three streets involved are local streets.
 - 2) The two streets shall be separated by a distance of three hundred (300) feet between centerlines measured along the centerline of the street being intersected when one or more of the streets involved is a collector streets.
 - 3) The two streets shall be separated by a distance of eight hundred (800) feet between centerlines measured along the centerline of the street being intersected when one or more of the streets involved is an arterial street.
- 48A-26.5.d. Clear sight triangles shall be provided at all intersections. The maximum height of any object within such triangles shall be two and one-half (2½) feet and no object that could obscure the vision of a motorist shall be permitted. Such triangles shall be established as specified below:

- 1) Seventy-five (75) feet from the point of intersection of the centerlines of two intersecting local streets.
 - 2) One hundred (100) feet from the point of intersection of the centerlines of two streets where one street is a collector street.
 - 3) One hundred fifty (150) feet from the point of intersection of the centerlines of two streets where one street is an arterial street.
- 48A-26.5.e. Whenever a portion of the line of such triangles falls within the proposed building setback line, such portion shall be shown on the final subdivision or land development plan and shall be considered a building setback line.
- 48A-26.6. Street Grades
- 48A-26.6.a. Centerline grades shall be not less than eight tenths (.8) of one percent.
- 48A-26.7 Cul-de-Sacs
- 48A-26.7.a. Dead end streets shall be prohibited unless designed as cul-de-sac streets or designed for future access to adjoining properties.
- 48A-26.7.b. Cul-de-sac streets permanently designed as such shall not exceed six hundred (600) feet in length and shall not furnish access to more than twenty-five (25) dwelling units.
- 48A-26.7.c. The minimum radius of the cul-de-sac turnaround shall be forty (40) feet, measured to the outer pavement or curbline.
- 48A-26.7.d. Drainage of cul-de-sacs shall preferably be towards the open end.
- 48A-26.8 Half Streets and Alleys
- 48A-26.8.a. The creation of new half streets at the perimeter of a new subdivision or land development is prohibited.
- 48A-26.8.b. Alleys shall be prohibited in new subdivisions and land developments.

48A-26.9. Driveways

48A-26.9.a. Wherever possible, the centerline of a driveway at the point of access to a street shall be located no closer than forty (40) feet to another street intersection.

48A-26.9.b. Where a property has frontage on a local street and on a collector street, the driveway serving such property should, if practicable, have access onto the local street only. Similarly, where a property has access frontage on two streets of the same classification, the driveway serving such property should, if practicable, have access onto the street with the lower traffic volume.

SECTION V

DESIGN STANDARDS FOR NON-RESIDENTIAL SUBDIVISIONS AND LAND DEVELOPMENTS

48A-27. APPLICABILITY.

48A-27.1. The standards of this section shall apply to all subdivisions and land developments involving commercial, office, institutional or industrial uses.

48A-27.2. Where there are no specific standards governing street design for non-residential subdivisions and land developments, the regulations for residential streets (Section 48A-26) shall apply.

48A-28. SITE DESIGN

48A-28.1. The size and the configuration of lots within a non-residential subdivisions or land developments shall adhere to the following set of criteria:

- a) Compliance with the Tinicum Township Zoning Ordinance.
- b) The total area shall be of sufficient area and shape to provide adequate space for off-street parking and loading, landscaping, and other facilities.
- c) The location and orientation of lots and structures shall be arranged in a manner which allows for adequate access to a public street provision of adequate off-street, parking, and efficient traffic circulation.
- d) The overall development plan shall be laid out as, or as part of, a single architectural and landscaping scheme that is a desirable and harmonious addition to the general environment of the area.
- e) An efficient layout of streets shall be provided for safety and convenience and safety in routine access and internal circulation movements.

48A-29. BLOCK DESIGN

48A-29.1. The block layout shall conform to the best possible layout to permit good traffic circulation, to allow for off-street parking and to maximize the efficiency of deliveries and loading operations.

48A-29.2. The size and configuration of blocks shall be determined with due regard to the following criteria:

- a) Provision of building sites adequately suited to the specific needs of the uses proposed.
- b) Requirements of the Township Zoning Ordinance.
- c) Provision of convenient access, circulation, and safety of pedestrian and vehicular traffic.
- d) Block lengths shall be a minimum of six hundred (600) feet and a maximum of one thousand five hundred (1,500) feet.

48A-30. LOT DESIGN

48A-30.1. The lot size and dimensional requirements of the Tinicum Township Zoning Ordinance shall be complied within all subdivisions.

48A-30.2. Each lot shall front upon an existing or proposed public or private street.

48A-30.3. Remnants of land after subdivision shall be incorporated into adjacent parcels or offered for dedication for public purposes.

48A-30.4. Lots which are located adjacent to residential lots shall be required to provide sufficient buffering and screening as required in the Township Zoning Ordinance.

48A-31. BUILDING LOCATIONS

48A-31.1. In order to encourage an attractive building arrangement, variations in the setback alignments of buildings erected on the same street frontage should be implemented wherever possible.

48A-31.2. Buildings shall be arranged in a manner which minimizes conflicts between:

- a) Pedestrian and vehicular traffic;
- b) Pedestrian traffic and loading areas and,
- c) Non-residential buildings and facilities, and residential neighborhoods.

48A-31.3. Clustering and grouping of non-residential buildings is encouraged whenever possible in order to provide larger, more usable open areas without decreasing the overall density of development.

48A-32. STREET DESIGN

48A-32.1. The street system of a proposed non-residential subdivision or land development shall be designed to create a functional street pattern to prevent the congestion of existing streets and to assure the free flow of through traffic with the avoidance of conflict with parking or loading areas.

48A-32.2. Non-residential developments may be served with access by a public street or by a system of private access roads including but not limited to the following:

- a) Entrance Road - To provide direct access into local commercial establishments, office parks, industrial facilities, or other employment centers.
- b) Secondary Road - To provide access to individual lots in industrial and office parks.

48A-32.3. Street widths of private access roads serving non-residential developments exclusively shall be in accordance with the minimum standards listed in Table 3 below:

TABLE 3

NON-RESIDENTIAL STREET WIDTHS		
	Entrance Road (Feet)	Secondary Road (Feet)
Right-of-Way Width	60	60
Cartway Width	36	36

- 48A-32.4. Parking shall be prohibited on entrance roads and secondary roads.
- 48A-32.5. Horizontal curves for both entrance roads and secondary roads shall have minimum radii of three hundred (300) feet.
- 48A-32.6. Streets designed or intended for the sole use of non-residential vehicular traffic circulation shall not be extended to the boundaries of an adjacent existing or potential residential area or connected to a street intended for predominantly residential traffic.
- 48A-32.7. The arrangement of streets shall provide for continuation of existing or proposed streets and proper access to adjacent undeveloped tracts suitable for future non-residential development.
- 48A-32.8. Proposed developments which anticipate an average daily traffic of over six hundred (600) vehicles shall provide a minimum of two (2) points of access to a public street.
- 48A-32.9. The distance between points of access on any public street shall be at least two hundred (200) feet.
- 48A-33. STREET INTERSECTIONS
- 48A-33.1. Streets shall be laid out to intersect as nearly as possible at right angles.
- 48A-33.2. Multiple intersections involving the junction of more than two streets shall be prohibited.
- 48A-33.3. Streets entering opposite sides of another street shall be laid out either directly opposite one another or with a minimum off-set of three hundred (300) feet between their centerlines.
- 48A-33.4. Clear sight triangles shall be provided at all intersections. Such triangles shall be established from a minimum distance of one hundred (100) feet from the point of intersection of the centerlines of two streets. Within such triangles, no object greater than two and one-half (2 1/2) feet in height and no object that would obscure the vision of a motorist shall be permitted.

48A-34. CUL-DE-SACS

48A-34.1. The minimum radius of a cul-de-sac turnaround shall be fifty (50) feet measured to the outer pavement or curbline. However, the Board of Commissioners may require a greater turnaround radius where the Planning Commission and Township Engineer have made such recommendations based on an evaluation of the types and size of trucks and other vehicles anticipated to serve the proposed subdivision or land development.

48A-34.2. The maximum length, minimum width and number of traffic lanes of entrance roads designed as permanent cul-de-sacs shall be determined by the anticipated traffic volumes and types of uses in the development served.

48A-35. PARKING

48A-35.1. Off-street parking facilities shall be provided in accordance with the requirements of the Township Zoning Ordinance.

48A-35.2. The standard parking space shall be nine (9) feet in width and eighteen (18) feet in depth.

48A-35.3. A maximum of twenty-five (25) percent of the parking spaces in parking areas of twenty (20) or more spaces maybe designed and designated for compact cars. The dimensions for a compact car parking space shall be sixteen (16) feet in length, and eight (8) feet in width.

48A-35.4. At least three (3) percent of the parking spaces, within common parking areas containing twenty (20) or more spaces which serve non-residential uses shall be designed and identified for use by individuals with physical disabilities. Such spaces shall be twelve (12) feet in width and eighteen (18) feet in length.

48A-35.5. No more than thirty (30) parking spaces shall be permitted in a continuous row without being interrupted by landscaping, in parking areas containing fifty (50) or more spaces.

48A-35.6. All parking spaces shall be clearly marked so as to provide for orderly and safe parking.

48A-35.7. Off-street parking areas shall be paved according to the specifications of the Township Engineer and shall be suitably illuminated.

48A-35.8. Traffic to and from parking areas shall be channelized by the use of raised curbs or other suitable barriers.

48A-35.9. Where practicable, access points shall be located on minor streets. Such access points shall be located as far as feasible from another street intersection.

48A-36. SCREENING AND BUFFERING

48A-36.1. Screening and buffering shall comply with the requirements of the Township Zoning Ordinance, Chapter 61 of the Code of Tinicum Township.

SECTION VI

IMPROVEMENT SPECIFICATIONS

48A-37. GENERAL REQUIREMENTS

48A-37.1. Physical improvements and amenities which appear on the final plan of a subdivision or land development shall be installed, constructed, or provided by the developer as shown on the plan and in compliance with this and all Township codes and ordinances.

48A-37.2. All improvements installed by the developer shall be constructed in accordance with the design specifications of the Township Board of Commissioners and Township Engineer. Final approval by the Township shall not be granted until the required improvements have been deemed acceptable by the Board of Commissioners.

48A-38. PERFORMANCE GUARANTEE

48A-38.1. Prior to final approval of a subdivision or land development plan, the developer shall submit, to the Township, a completed and executed original copy of the Subdivision Improvements Agreement and Performance Guarantee in an amount of one hundred ten (110) percent of the cost of all improvements required by this Ordinance, as estimated by the Township Engineer in a form and with a surety approved by the Township Solicitor, guaranteeing the construction and installation of all such improvements within a period of time established by the Board of Commissioners of Tinicum Township.

48A-38.2. The Board of Commissioners may require the performance guarantee, required in Section 48A-38.1 above, to be increased by ten (10) percent for each one year period beyond the first year required by the developer to complete the necessary improvements.

48A-39. MAINTENANCE GUARANTEE

48A-39.1. In addition to the Performance Guarantee, the developer shall deliver to the Township a maintenance guarantee in an amount of not less than five (5) percent of the Township Engineer's estimate of the cost of all improvements required by this Ordinance, guaran-

teeing that the developer shall maintain all such improvements in good condition for a period of one (1) year after completion and approval of the improvements.

48A-40.

REQUIRED IMPROVEMENTS

48A-40.1.

Improvements shall be provided, constructed, and installed by the developer as stated in the Improvements Agreement, shown on the record plan, and in accordance with the design standards set forth in this Ordinance and the specifications approved by the Township Engineer. The following improvements will be required in all applicable cases:

- a) Street excavating, grading, subgrade preparation, base course paving, and surface course paving.
- b) Concrete curbs or gutters, stabilized shoulders, and drainage swales.
- c) Concrete sidewalks or interior walkways.
- d) Sanitary sewer system.
- e) Storm drainage system.
- f) Water supply and distribution system.
- g) Monuments located at all permanent outbounds.
- h) Fire hydrants.
- i) Street lights.
- j) Street signs.
- k) Shade trees.

48A-40.2.

The developer shall notify the Township Secretary seventy-two (72) hours in advance of any construction or installation of any improvements requiring inspection by the Township Engineer.

48A-40.3.

The developer shall pay all engineering, inspection, and legal expenses which the Township may incur and which are connected with or incidental to the development, the preparation or the approval of the foregoing agreements, bonds, resolutions, and inspection.

48A-41. RELEASE FROM IMPROVEMENT BOND

- 48A-41.1 When the developer has completed all of the necessary and appropriate improvements, the developer shall notify the Township Board of Commissioners and Township Engineer by certified or registered mail, of the completion of the improvements. The Township Engineer shall inspect the improvements and notify the developer, within thirty (30) days from the date of receipt of the completion notice, of the approval or rejection of the improvements or any portion thereof. A detailed report containing reasons for rejection shall accompany any notification of the rejection of improvements.
- 48A-41.2. The Township Board of Commissioners shall notify the developer by certified or registered mail, of the action taken regarding the inspection of the improvements in a subdivision or land development. In accordance with Section 510 of the Pennsylvania Municipalities Planning Code.
- 48A-41.3. If the Board of Commissioners or Township Engineer fails to comply with the provisions of this section, then all improvements will be deemed to have been approved, and the developer shall be released from all liability, pursuant to its Performance Guarantee Bond.
- 48A-41.4. In the event that any of the necessary and appropriate improvements have not been installed, constructed, or completed as provided in this Subdivision and Land Development Ordinance or as proposed on the final plan, the Board of Commissioners of Tinicum Township is hereby granted the power to enforce any corporate bond or other security by appropriate legal and equitable remedies. The Township may take legal action to secure all necessary equity from the developer to install, repair, or correct any unacceptable improvements provided by the developer.

SECTION VII

DEFINITIONS

48A-42. WORD USAGE

For the purpose of this Ordinance, words used in the present tense include the future tense; the singular includes the plural and the plural includes the singular. The word "shall" is always mandatory and the word "may" is always permissive.

48A-43. DEFINITIONS

Unless otherwise expressly stated, the following terms have the meanings indicated. Applicable regulations stated in conjunction with these definitions shall be complied with.

48A-43.1. Terms.

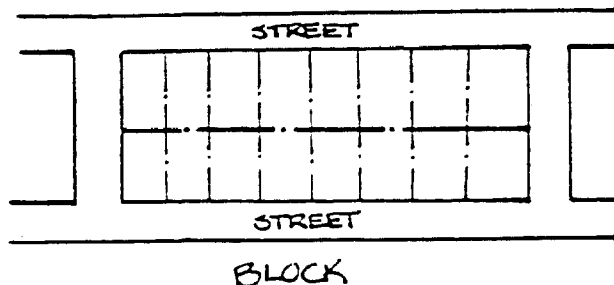
ALLEY - A secondary vehicular accessway which may or may not be dedicated to the Township providing a means of public access to abutting property and not intended for general traffic circulation.

APPLICANT - A landowner or developer who has filed an application for a subdivision or land development, including his agents, heirs, and legal representatives.

ARCHITECT - A person licensed to practice architecture in the Commonwealth of Pennsylvania.

BASE FLOOD ELEVATION - The highest elevation, expressed in feet above sea level, of the level of flood waters occurring from a one hundred (100) year flood.

BLOCK - A tract of land bounded by streets or a combination of streets, railroad rights-of-way, waterways, public land, unsubdivided area, or other definite barrier.



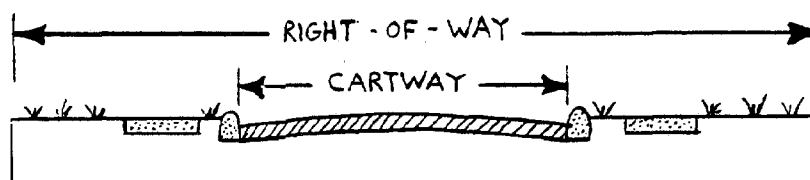
BOARD OF COMMISSIONERS - The Board of Commissioners of Tinicum Township.

BUILDING - Any structure having a roof supported by columns or walls; intended for the shelter, housing or enclosure of any individual, animal, process, equipment, goods or materials of any kind or nature; which may or may not be solely on one lot.

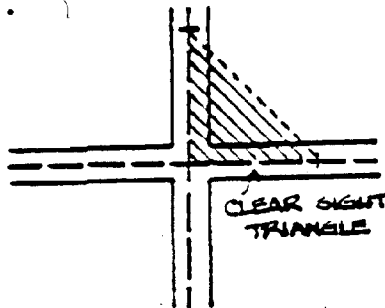
BUILDING, ACCESSORY - A subordinate structure on the same lot as a principal building or use occupied or devoted to a use incidental to the use of the principal building.

BUILDING, PRINCIPAL - A building in which is conducted the principal use of the lot on which it is located.

CARTWAY - The improved surface of a street right-of-way which is available for vehicular traffic, including parking lanes but excluding shoulders, drainage swales and curbs.



CLEAR SIGHT TRIANGLE - An area of unobstructed vision at a street intersection defined by lines of sight between points at a given distance from the intersection of the street centerlines.



COMPREHENSIVE PLAN - "The Comprehensive Plan Update 1981 for Tinicum Township, Delaware County PA"; adopted in 1981 as amended or updated.

COUNTY - Delaware County, Commonwealth of Pennsylvania.

CUL-DE-SAC - A local street intersecting another street at one end and terminating at the other end in a vehicular turnaround.

DEAD END STREET - A street with a single common ingress and egress, having an abrupt terminus not designed for vehicular turnaround.

DEDICATION - The deliberate appropriation of land by its owner for any general and public or limited public use, reserving to himself no other rights than are compatible with the full exercise and enjoyment of the public uses to which the property has been devoted.

DEVELOPER - Any landowner or agent or a landowner who makes or causes to be made a subdivision of land or a land development.

DEVELOPMENT PLAN - A proposal for the subdivision and/or development of land, prepared in accordance with the Zoning and Subdivision Ordinances of Tinicum Township including the plat plan and all supplementary data required.

DWELLING UNIT - Any structure or portion thereof, designed for occupancy as a separate living quarters with cooking, sleeping and sanitary facilities provided within the dwelling unit for the exclusive use of a single family.

EASEMENT - A right-of-way through a parcel of land granted by the property owner to another person, organization, or entity for certain specified purposes.

ENGINEER - A registered Professional Engineer licensed as such in the Commonwealth of Pennsylvania.

FILL - 1. Any act by which earth, sand, gravel, rock, or any other material is placed, pushed, dumped, pulled, transported, or moved to a new location above the natural surface of the ground. 2. The difference in elevation between a point on the original ground and a designated point of higher elevation on the final grade. 3. The material used to make a fill.

FLOODPLAIN - Any land area susceptible to being inundated by water from stormwater runoff or overflowing bodies of water.

Floodplain boundary lines are established by the Federal Emergency Management Agency.

GOVERNING BODY - The Board of Commissioners of Tinicum Township, Delaware County.

IMPROVEMENT - Those physical additions, installations, and changes required to render land suitable for the use proposed.

LAND DEVELOPMENT - The improvement of one lot or two or more contiguous lots, tracts, or parcels or land for any purpose involving a group of two or more buildings or the division or allocation of land between or among two or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups, or other features.

LANDOWNER - The legal or beneficial owner or owners of land including the holder of an option or contract to purchase (whether or not such option or contract is subject to any condition), or a lessee if he is authorized under the lease to exercise the rights of the landowner.

LOT - Any parcel, tract or area of land established by plat, subdivision, or as otherwise permitted by law; defined in the plan or deed of record by property lines, metes and bounds; intended as a unit for development, improvement, use or transfer of ownership.

LOT AREA - The total area within the lot lines of a lot.

LOT, CORNER - A lot abutting upon two or more streets at their intersection.

LOT, REVERSE FRONTAGE - A lot extending between, and having frontage on two generally parallel streets with vehicular access from one or both streets.

LOT COVERAGE - That portion of a lot occupied by buildings, and all improved surfaces.

LOT LINE - A line of record bounding a lot which divides one lot from another lot or from a public or private street or any other public space.

LOT LINE, FRONT - The lot line which separates a lot from a street right-of-way.

LOT LINE, REAR - The lot line opposite and most distant from the front line; or in the case of irregularly shaped lots, a line entirely within the lot, parallel to and at a maximum distance from the front lot line.

LOT LINE, SIDE - Any lot line other than a front or rear lot line.

LOT WIDTH - The horizontal distance between the side lot lines at the building line.

MONUMENT - A stone or concrete marker used as a permanent reference point such as corners of lots. Required monuments shall be a minimum of thirty (30) inches in length and four (4) inches square.

ONE HUNDRED YEAR FLOOD - A flood that, on the average, is likely to occur once every one hundred (100) years; a flood that has a one (1) percent chance of occurring each year, although the flood may occur in any year. The official boundary and elevation of the one hundred year flood has been established by the Federal Emergency Management Agency.

OPEN SPACE - The unimproved, unoccupied area of a lot or tract that is intended for public or private use or enjoyment, included are areas set aside or used for buildings, parking, loading, or streets.

OPEN SPACE, COMMON - Open space which is publicly owned, or set aside, dedicated, designated, or reserved for the use or enjoyment of the public or local residents adjoining such neighboring open space.

PARCEL - A lot or tract of land.

PARKING AREA - Any public or private land area designed and used for parking or storage of motor vehicles, including parking lots, garages, private driveways, and legally designated areas of public streets.

PARKING SPACE - An outdoor or garage paved area used for the parking and/or storage of one (1) motor vehicle, which shall measure at least nine (9) feet by twenty (20) feet, one

hundred eighty (180) square feet and to which there is access from a street, alley, or driveway.

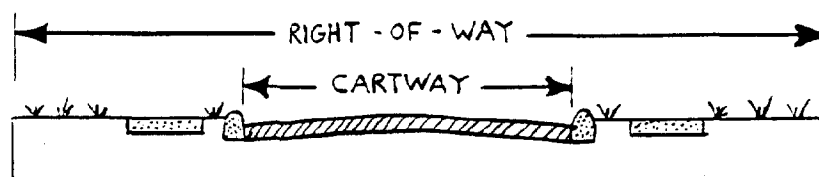
PLAN, SKETCH - An informal plan indicating salient existing features of a tract and its surroundings and the general layout of a proposed subdivision or land development to be used as a basis for discussion and consideration by the Township.

PLAN, PRELIMINARY - A tentative plan, showing approximate proposed street and lot layout in lesser detail than a final plan required as a basis for consideration of the Township prior to preparation of a final plan, prepared by a Qualified Professional Surveyor, Architect, Engineer, or Landscape Architect.

PLAN, FINAL - A complete and exact plan, including all supplemental required data, prepared for official recording. The final plan shall be prepared by a professional land surveyor, engineer, architect, or landscape architect. The metes and bounds for the out-bounds survey of the site must be certified by a professional land surveyor registered in the Commonwealth of Pennsylvania.

PLANTED VISUAL SCREEN - A strip of evergreen plantings adjacent to the boundary of a property which shall be of sufficient height and density to constitute an effective visual screen giving visual protection to abutting properties. Such screens shall be permanently maintained and are further regulated in the Township Zoning Ordinance.

RIGHT-OF-WAY - A strip of land acquired by reservation, dedication, prescription, or condemnation occupied or intended to be occupied by a street, road, crosswalk, railroad, electric transmission line, oil or gas pipeline, water line, sanitary storm sewer or other similar uses.



STREET - A right-of-way which serves as a means of vehicular and pedestrian access to abutting lots, including a paved area or cart-way; and used to provide space for installation of improvements such as sewers, other utilities, sidewalks and street trees.

STREET LINE - A line coterminous with the legal right-of-way line of a street.

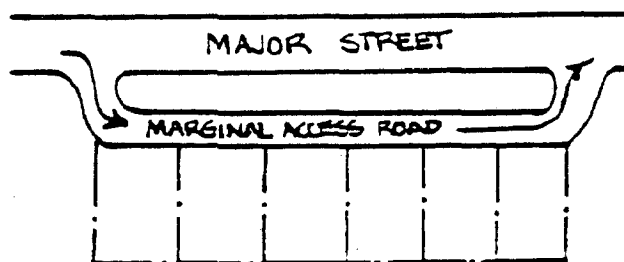
STREET, LOCAL - A street designed to provide vehicular access to abutting property and to discourage through traffic.

STREET, ARTERIAL - Streets which carry, or are designed and intended to carry large volumes of traffic at high speeds and which are used primarily to connect communities.

STREET, COLLECTOR - Streets which carry traffic from local street to arterial streets or to major facilities or developments.

STREET, HALF - A street, generally parallel and adjacent to a property line, having a lesser right-of-way width than normally required for satisfactory improvement and use of the street.

STREET, MARGINAL ACCESS - A minor street, parallel and adjacent to major traffic streets, providing access to abutting properties, and control of the intersection with the major traffic street.



STRUCTURE - A combination of materials used to form a construction for use or occupancy, whether installed on, above or below the surface of land or water.

SUBDIVISION - The division or redivision of a lot, tract, or parcel or land by any means into two (2) or more lots, tracts, parcels, or other divisions of land including changes in

existing lot lines for the purpose, whether immediate or future, of lease, transfer or ownership, or building or lot development.

SUBDIVISION, MAJOR - A subdivision resulting in the creation of five (5) lots or more, any non-residential subdivision involving the extension of municipal facilities, the creation of a street, or the extension of an existing street; land developments shall also be considered major subdivisions.

SUBDIVISION, MINOR - A subdivision resulting in the creation of four (4) lots or less and which does not involve the construction or extension of any streets or municipal facilities.

TRACT - A parcel of land, a lot, area, or property having the potential to be subdivided.

TOWNSHIP - The Township of Tinicum, Delaware County, Commonwealth of Pennsylvania.

WATERCOURSE - A permanent or intermittent stream, river, brook, creek, channel, or ditch carrying water, whether natural or man made.

WETLANDS - Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions.

ZONING ORDINANCE - The Tinicum Township Zoning Ordinance, Chapter 61 of the Code of the Township of Tinicum as amended.

APPENDIX A

A. RATIONAL FORMULA

- 1) The rational formula used in calculating runoff is $Q=CIA$. In this equation, Q is the peak runoff in cubic feet per second, C is a runoff coefficient which depends on the nature of the land cover, I is the intensity of rainfall in inches per hour for a duration equal to the time of concentration for the drainage area involved and A is a watershed area in acres. The time of concentration is the time required for runoff from the upper reaches of the watershed to reach the point for which runoff rates are being calculated.

B. VALUES OF COEFFICIENT "C"

- 1) Runoff coefficients used in the rational formula shall be based on the guidelines in the following table and acceptable to the municipal engineer.

RUNOFF COEFFICIENTS FOR THE RATIONAL METHOD

<u>Type of Drainage Area</u>	<u>Coefficient</u>	<u>Source</u>
Commercial	0.70 - 0.95	1
Downtown (also shopping centers)		
Neighborhood (also mixed residential and commercial)	0.50 - 0.70	1
Residential		
Urban		
Single-Family	0.30 - 0.50	1
Multi-Family	0.40 - 0.80	1
Suburban, Single Family	0.25 - 0.40	1
Garden Apartments	0.50 - 0.70	1
Playgrounds	0.20 - 0.70	1
Industrial	0.20 - 0.90	1
Railroad Yards	0.20 - 0.35	1
Parks, Cemeteries, Golf Courses	0.15 - 0.30	2
Unimproved, with Vegetation	0.10 - 0.30	1
Pavement		
Concrete or Bituminous		
Concrete	0.75 - 0.95	2
Surface Treated Roadway	0.65 - 0.80	2
Gravel, earth, other	0.25 - 0.60	2
Roofs	0.75 - 0.95	1

RUNOFF COEFFICIENTS FOR THE RATIONAL METHOD
(Continued)

<u>Type of Drainage Area</u>	<u>Coefficient</u>	<u>Source</u>
Lawns, Sandy Soil		
Flat, 2% or less	0.05 - 0.10	1
Average, 2 to 7%	0.10 - 0.15	1
Steep, 7% or more	0.15 - 0.20	1
Lawns, Heavy Soil		
Flat, 2% or less	0.13 - 0.17	1
Average, 2 to 7%	0.18 - 0.22	1
Steep, 7% or more	0.25 - 0.35	1
Woods, Heavy Brush		
Gravel	0.15 - 0.35	2
Sandy Soil	0.15 - 0.30	2
Clay Soil	0.25 - 0.60	2
Bare, Cultivated, or Light Growth		
Gravel	0.20 - 0.40	2
Sandy Soil	0.15 - 0.30	2
Clay Soil	0.35 - 0.75	2

NOTE: Lower portions of ranges apply to flat slopes and open soils; higher portions apply to steeper slopes and tight or shallow soils.

SOURCE: (Applied with some modifications by G. Edwin Pidock Co.)

- 1 - Design and Construction of Sanitary and Storm Sewers - prepared by a Joint Committee of American Society of Civil Engineers and the Water Pollution Control Federation.
- 2 - Design Manual, Part 2, Chapter 12 Pennsylvania Department of Transportation.

NOTE: The Township Engineer may want to require use of a specific method for determining overland flow times. If so, it should be substituted for this section.

APPENDIX B

A. MANNING'S EQUATION

- 1) Manning's equation to determine the velocity of flow in open channels and closed drains not under pressure is listed below. The second equation is used to determine the capacity after the velocity has been determine.

$$V = \frac{1.48}{n} \quad 3 \quad \frac{a}{p} \quad s$$

$$Q = va$$

- v = velocity in feet per second.
n = coefficient of roughness.
a = cross-sectional area of flow in square feet.
p = wetted perimeter, the length of the line of contact between the water and the bottom and sides of the channel or pipe around the cross-section in feet.
s = slope of the channel or pipe in feet per foot.
q = capacity of the channel or pipe in cubic feet per second.

- 2) The coefficient of roughness used shall be as follows unless different coefficients are approved by the Township Engineer.

- 0.015 for concrete pipes and paved channels
0.021 for corrugated metal pipes
0.035 for earth ditches
0.040 for vegetated channels

B. MAXIMUM STREAM VELOCITIES IN OPEN CHANNELS

<u>Material</u>	<u>Maximum Velocity Feet per Second</u>
Well established grass on good soil	
Short pliant bladed grass	4-5
Bunch grass-soil exposed	2-4
Stiff stemmed grass	2-3
Earth withouth vegetation	
Fine sand or silt	1-2
Ordinary firm loam	2-3
Stiff clay	3-5
Clay and gravel	4-5
Course gravel	4-5
Soft shale	5-6

<u>Material</u>	<u>Maximum Velocity</u> <u>Feet per Second</u>
Other	
Bituminous or cement stablized channels	6
Paved channels	10-15

US Department of Commerce
NOAA Coastal Services Center Library
2234 South Hobson Avenue
Charleston, SC 29405-2413

